THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 36

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte ROBERT L. METCALF and RICHARD L. LAMPMAN

_____

Appeal No. 94-2842
Application 07/882,351[1]

_____

ON BRIEF

_____

Before JOHN D. SMITH, PAK and OWENS, *Administrative Patent Judges*.

OWENS, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the examiner's final rejection of

[1] Application for patent filed May 6, 1992. According to appellants, the application is a continuation of Application 07/759,114, filed September 9, 1991, now abandoned, which is a continuation of Application 07/435,950, filed November 13, 1989, now abandoned, which is a continuation-in-part of Application 07/170,159, filed, March 18, 1988, now Patent No. 4,880,624, issued November 14, 1989.

claims 8-31, which are all of the claims remaining in the application.

THE INVENTION

Appellants' claimed invention is a bait for northern corn rootworm and a method for attracting northern corn rootworm. Claims 8 and 20 are illustrative and read as follows:

8. A bait for northern corn rootworm, said bait comprising:

(a) a volatile attractant selected from the group consisting of:

4-methylphenylethanol,
4-methoxyphenylethanol,
3-methoxyphenylethanol,
2-methoxyphenylethanol
4-chlorophenylethanol,
4-fluorophenylethanol,
4-methoxyphenylpropanol,
phenyl propanol,
phenylethylamine; and
phenylpropylamine; and

(b) a nonvolatile compulsive feeding stimulant for *Diabrotica*, said stimulant comprising a cucurbitacin.

20. In a method for attracting northern corn rootworm, the improvement comprising the step of employing an effective amount of a compound selected from the group consisting of:

4-methylphenylethanol,
4-methoxyphenylethanol,

3-methoxyphenylethanol,
2-methoxyphenylethanol
4-chlorophenylethanol,
4-fluorophenylethanol,
4-methoxyphenylpropanol,
phenyl propanol,
phenylethylamine; and
phenylpropylamine.

THE REFERENCES

Hennart et al. (Hennart)	4,205,066	May 27, 1980
Metcalf et al. (Metcalf '922) (Canadian patent)	1,195,922	Oct. 29, 1985

J.F. Andersen and R.L. Metcalf, "Factors Influencing Distribution of *Diabrotica* spp. in Blossoms of Cultivated *Cucurbita* spp.", 13 *J. Chem. Ecology* 681-99 (1987) (Andersen).

R.L. Lampman et al., "Semiochemical Attractants of *Diabrotica undecimpunctata howardi* Barber, Southern Corn Rootworm, and *Diabrotica virgifera virgifera* LeConte, the Western Corn Rootworm (Coleoptera: Chrysomelidae)", 13 *J. Chem. Ecology* 959-75 (1987) (Lampman I).

Richard L. Lampman and Robert L. Metcalf, "Multicomponent Kairomonal Lures for Southern and Western Corn Rootworms (Coleoptera: Chrysomelidae: *Diabrotica spp.*)", 80 *J. Econ. Entomol.* 1137-42 (Dec. 1987) (Lampman II).

Robert L. Metcalf et al., "Dry Cucurbitacin-containing Baits for Controlling Diabroticite Beetles (Coleoptera: Chrysomelidae)", 80 *J. Econ. Entomol.* 870-75 (Aug. 1987) (Metcalf).[2]

A.M. Rhodes et al., "Diabroticite Beetle Responses to

[2]This article, which is incorrectly cited on page 3 of the answer, is the Metcalf article which is referred to by the examiner as "Metcalf et al (B26)" in the statement of the rejection (answer, page 6) and is relied upon in the examiner's rejection as indicated by the discussion on page 7 of the answer.

Cucurbitacin Kairomones in *Cucurbita* Hybrids", 105 *J. Amer. Soc. Hort. Sci.* 838-42 (1980) (Rhodes).

Yukio Ishikawa et al., "Controlled release formulation of attractant for the onion and seed-corn flies, *Hylemya antiqua* and *H. Platura* (Diptera: Anthomyiidae)", 22 *Appl. Entomol. Zool.* 303-9 (1987), *abstracted in* 107 *Chem. Abstracts* 170560c (1987) (Ishikawa).

D.R. Lance, "Potential of 8-methyl-2-decyl propanoate and plant-derived volatiles for attracting corn rootworm beetles (Coleoptera: Chrysomelidae) to toxic bait", 81 *J. Econ. Entomol.* 1359-62 (1988), *abstracted in* 109 *Chem. Abstracts* 224679k (1988) (Lance).

Phenethyl alcohol, 7094, *The Merck Index* (10th ed., Merck & Co. 1983) (Merck).

THE REJECTION

Claims 8-31 stand rejected under 35 U.S.C. § 103 as being unpatentable over Merck, Andersen, Lampman I, Lampman II, Ishikawa, Rhodes, Metcalf '922, Hennart, Metcalf and Lance.[3,4]

OPINION

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with the examiner that the invention recited in claims 8-19 and 23-31 would have been

[3]The examiner also rejected claims 8-19 over the same references using essentially the same language when explaining the rejection. Hence, we need not further address this rejection.

[4]The rejections under 35 U.S.C. §§ 101 and 112, first paragraph, in the final rejection (paper no. 27 mailed on June 2, 1993) were withdrawn in the examiner's answer (pages 3-4).

obvious to one of ordinary skill in the art at the time of appellants' invention over the applied references. Accordingly, the rejection of these claims will be affirmed. However, we agree with appellants that the rejection of claims 20-22 is not well founded. Accordingly, we will reverse the rejection of claims 20-22.

At the outset, we note that appellants state that the claims stand or fall in five groups as follows: Group I, claims 8 and 15-18; Group II, claims 9-14 and 19; Group III, claims 20-22; Group IV, claims 23-28; and Group V, claims 29-31 (brief, pages 7-8). We therefore limit our discussion to one claim within each group, namely, claims 8, 9, 20, 23 and 29. *See* 37 CFR § 1.192(c)(5)(1993).

Claim 23

The invention recited in claim 23 is a bait for northern corn rootworm which includes phenylethanol as a volatile attractant in combination with a cucurbitacin as a nonvolatile compulsive feeding stimulant.

Metcalf teaches that cucurbitacins are powerful feeding stimulants for a number of crop pests including northern and southern rootworm, but that they are not volatile and are ineffective as long-range attractants (page 870). Metcalf

further teaches that combining volatile attractants with cucurbitacins in pest baits can greatly enhance the distance over which the baits act. *Id.* Metcalf does not disclose use of phenylethanol as the volatile attractant. However, Andersen (page 696) and Lampman I (page 964, Table 1) both teach that phenylethanol is effective for attracting southern corn rootworm. It therefore would have been *prima facie* obvious to one of ordinary skill in the art to combine a cucurbitacin and phenylethanol in a bait for southern corn rootworm.

Appellants argue regarding claim 23 that the references do not suggest using phenylethanol as an attractant for northern corn rootworm (page 36). This argument is not well taken because the invention in claim 23 is the bait itself, not a method for using it to attract any particular pest.

Claims 8 and 9

Claim 8 recites a bait for northern corn rootworm which includes a volatile attractant selected from a group of ten attractants, in combination with a cucurbitacin as a nonvolatile compulsive feeding stimulant. Claim 9, which depends from claim 8, recites only five of the attractants in claim 8.

The applied references do not disclose any of the volatile attractants recited in claims 8 and 9. However, both Andersen

(page 696) and Lampman I (page 964, Table 1) disclose use of phenylethanol as an volatile attractant for southern corn rootworm, and Lampman (page 964, Table 1) also discloses use of *p*-anisyl alcohol (i.e., 4-methoxyphenyl alcohol) for the same purpose. Two of the volatile attractants recited in appellants' claims 8 and 9 are phenylpropanol, which is an adjacent homolog of phenylethanol, and 4-methoxyphenyl ethanol, which is an adjacent homolog of 4-methoxyphenyl propanol. Adjacent homologs, due to their structural similarity, are expected to have similar properties. *See In re Henze*, 181 F.2d 196, 201, 85 USPQ 261, 265 (CCPA 1950). Consequently, it would have been *prima facie* obvious to one of ordinary skill in the art, in view of the teachings by Andersen and Lampman I, together with the teaching by Metcalf discussed above, to use either phenylpropanol or 4-methoxyphenyl ethanol in combination with a cucurbitacin in a bait for southern rootworm. Appellants' argument (brief, pages 30-31) that *In re Grabiak*, 769 F.2d 729, 731-32, 226 USPQ 870, 872 (Fed. Cir. 1985), is to the contrary is not persuasive because the compounds in that case were not adjacent homologs.

Appellants argue that none of the volatile attractants recited in appellants' claims 8 and 9 is a homolog of the prior art northern corn rootworm attractants (brief, page 39). This

argument is not persuasive because claims 8 and 9 are directed toward a bait *per se*, not the use of it to attract any particular pest.

Appellants argue (brief, page 40) that, as indicated by the Lampman declaration (paper no. 19, filed April 10, 1992), the attraction of northern corn rootworm to 4-methoxyphenylpropanol is significantly less than that of 4-methoxyphenylethanol. The Lampman data are supportive of the rejection because the comparison of the homologs 4-methoxyphenylpropanol and 4-methoxyphenylethanol, and the homologs phenylethylamine and phenylpropylamine, indicates that if a compound is effective for attracting northern corn rootworm, its adjacent homolog also will be effective to some extent. Thus, the data do not support Lampman's statement (page 4) that there is no reasonable expectation that because compounds are structurally similar, they both will exhibit activity as an attractant for the same species of *Diabrotica*. The statement in Lampman I (page 963) that "[a] substantial decrease in SCR [southern corn rootworm] attraction was observed between compounds which differed only by one carbon and two hydrogens" and the discussion following this statement also support the rejection because the compounds all attracted southern corn rootworm to some extent. Appellants' claims are

not limited to any particular degree of attraction.

Comparisons which show the effect of hydroxy and methoxy groups are presented in the Lampman declaration (page 4). These comparisons do not overcome the rejection because the compounds compared are not adjacent homologs.

We note regarding the Lampman declaration that it is not enough for appellant to show that the results for appellant's invention and the comparative examples differ. The difference must be shown to be an unexpected difference. See *In re Freeman*, 474 F.2d 1318, 1324, 177 USPQ 139, 143 (CCPA 1973); *In re Klosak*, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972). Lampman does not provide an explanation, or even make an assertion, that unexpected results are presented.

Claim 29

The invention recited in claim 29 is a method for attracting northern corn rootworm by use of an effective amount of phenylethanol.

Andersen (page 696) and Lampman I (page 964, Table 1) both teach that phenylethanol is effective for attracting southern corn rootworm, but they do not address whether this compound is effective for attracting northern corn rootworm. However, because both of these rootworms are *Diabrotica* species, one of

ordinary skill in the art would have had a reasonable expectation that a compound which attracts one of the species also would attract the other to some extent.

Evidence that one of ordinary skill in the art would have had such an expectation is the data of Lampman I (page 969, Table 5), wherein the attraction of western, southern and northern rootworms to ten compounds is compared. The results show that in ten out of the thirteen tests in which one of the compounds attracted either southern corn rootworm or northern corn rootworm, the compound also attracted the other corn rootworm to some extent.

Thus, given that phenylethanol is effective for attracting southern corn rootworm, one of ordinary skill in the art would have had a reasonable expectation of success in using phenylethanol to attract northern corn rootworm. Because all that is required for a *prima facie* case of obviousness is a reasonable expectation of success rather than absolute certainty, *see In re O'Farrell*, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988), it would have been *prima facie* obvious to one of ordinary skill in the art to use phenylethanol to attract northern corn rootworm.

The evidence presented in the Lampman declaration discussed

above is consistent with the evidence in Lampman I. In the Lampman declaration, in five of seven cases in which one of western corn rootworm or northern corn rootworm was attracted to a tested compound, the other corn rootworm also was attracted to some extent. While the extent of attraction of the *Diabrotica* species to volatile attractants appears to be species-specific, one of ordinary skill in the art would have a reasonable expectation, as discussed above, that a compound which attracts one *Diabrotica* species also will attract the other species to some extent.

As with the declaration data discussed above, Lampman does not explain why or even assert that the results in the declaration are unexpected results.

Claim 20

Claim 20 recites a method for attracting northern corn rootworm by use of an effective amount of a compound selected from a group of ten compounds, none of which is shown in the applied prior art to be effective for attracting any rootworm. Two of the compounds, 4-methoxyphenylethanol and phenylpropanol, are adjacent homologs of 4-methoxyphenyl alcohol and phenylethanol which Lampman I teaches are effective for attracting southern corn rootworm (page 964, Table 1). To arrive

at appellants' invention recited in claim 20, it would be necessary to both substitute an adjacent homolog for one of the Lampman I compounds and to use this homolog to attract a different species of corn rootworm. While it would have been obvious to one of ordinary skill in the art, as discussed above, to use to attract southern corn rootworm an adjacent homolog of a compound known to attract that rootworm, or to use to attract northern corn rootworm a compound known to attract southern corn rootworm, we do not consider the evidence to be strong enough to support a finding that one of ordinary skill in the art would have had a reasonable expectation of success when making these substitutions in combination.

Conclusion

For the above reasons, we conclude, based on the evidence of record on balance, that the invention recited in appellants' claims 8-18 and 23-31, but not that recited in appellants' claims 20-22, would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103.

DECISION

The rejection of claims 8-19 and 23-31 under 35 U.S.C. § 103 as being unpatentable over Merck, Andersen, Lampman I, Lampman II, Ishikawa, Rhodes, Metcalf '922, Hennart, Metcalf and Lance,

is affirmed. The rejection under 35 U.S.C. § 103 of claims 20-22 over these references is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

JOHN D. SMITH Administrative Patent Judge	)	
CHUNG K. PAK Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
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